

Appendix 13

Tax Calculator for Microsimulation Model

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*****;
* program:      Tax Calculator for Microsimulation Model      ;
* programmer:   Rick Peterson                                ;
* project:     Washington Excise Tax Microsimulation Model    ;
* date:        Nov 21, 2002                                    ;
*;
* purpose:     Calculates excise taxes with current law rates and    ;
*               alternative rates                                ;
*;
*-----;
* libraries:   extaxmdl - location of excise tax model data sets    ;
*               popsur - location of Washington Population Survey data  ;
*-----;
* incoming:    Extaxmdl.taxbase&x Tax base for each imputation group  ;
*               popsur.sps00f04 Washington Population Survey                ;
*-----;
* formats:     'Formats for microsimulation model 1'                 ;
*               'Formats for microsimulation model 2'                 ;
*-----;
* outgoing:   None                                              ;
*-----;
* reports:    Total tax by tax type                            ;
*               Average tax by income group                      ;
*               Tax as a percent of Income by income group       ;
*-----;
* changes:    ;
*;
*-----;
* notes:    ;
*****;

*-----;
*Get household data from WAPOP to merge with tax data;
*-----;

Data z;
set popsur.sps00f04;
where pnum=1;
keep id fnlwgt hhinc peopl hhearn99
nwageinc chldrn20 adults21 age hhtype q4p4g;
run;
proc sort data=z;
by id;
run;

*Sum income by income class;

proc summary nway data=z;
class hhinc;
format hhinc incfmtd.;
var hhinc;
weight fnlwgt;
output out=incomebyclass sum=income;
run;

*-----;
*Apply tax rates to taxbase for each imputation group;
*-----;

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```
%macro loop1;
%do x=1 %to 7;

Data excisetaxes&x;
set Extaxmdl.taxbase&x;

*Sales tax;
salesrate = .084;
    salestax = salesbase*salesrate;
    alt1tax = .01* alt1base;
    alt2tax = .01* alt2base;

*Alcohol taxes;
    *Liquor sales and liter in container;
    Liquorsalesrate_container = .205;
    AltLiquorsalesrate_container = .205;
    Liquorliterrate = 2.4408;
    AltLiquorliterrate = 2.4408;
    liquorsalestax_container =
    liquorsalesbase_container*Liquorsalesrate_container;
    liquorvoltax_container = liquorvolbase_container *
    Liquorliterrate;
    Altliquorsalestax_container =
    liquorsalesbase_container*AltLiquorsalesrate_container;
    Altliquorvoltax_container = liquorvolbase_container *
    AltLiquorliterrate;

    *Liquor sales and liter by drink;
    Liquorsalesrate_drink = .137;
    AltLiquorsalesrate_drink = .137;
    liquorsalestax_drink =
    .15*liquorsalesbase_drink*Liquorsalesrate_drink;
    liquorvoltax_drink = liquorvolbase_drink * Liquorliterrate;
    Altliquorsalestax_drink =
    .15*liquorsalesbase_drink*AltLiquorsalesrate_drink;
    Altliquorvoltax_drink = liquorvolbase_drink *
    AltLiquorliterrate;

    *Wine tax;
    Wineliterrate = .2292;
    AltWineliterrate = .2292;
    Winelitertax = Wineliterbase*wineliterrate;
    AltWinelitertax = Wineliterbase*altwineliterrate;

    *Beer Tax - rate per 31 gallons;
    Beertaxrate = 8.08;
    AltBeertaxrate = 8.08;
    Beertax = beerbase * beertaxrate;
    AltBeertax = beerbase * altbeertaxrate;

*Insurance Tax;
    Insrate = .02;
    Altinsrate = .02;
    Instax = insrate*insbase;
    AltInstax = altinsrate*insbase;

*Cigarette and other tobacco products taxes;
    Cigrate = 1.425;
    Altcigrate = 1.425;
    cigtax = cigbase*cigrate;
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Altcigtax = cigbase*altcigrate;
Othertobrate = .1.294;
Altothertobrate = .1.294;
    othertobtax = othertobbbase*othertobrate;
    altothertobtax = othertobbbase*altothertobrate;

*Public Utility Tax;
ElecPUTrate = .0378+.03201;
AltElecPUTrate = .0378+.03201;
    ElecPUT = ElecPUTrate*elecbase;
    AltElecPUT = AltElecPUTrate*elecbase;
NatgasPUTrate = .03852+.03046;
AltNatgasPUTrate = .03852+.03046;
    NatgasPUT = NatgasPUTrate*naturalgasbase;
    AltNatgasPUT = AltNatgasPUTrate*naturalgasbase;
WaterseweragePUTrate = (.05029+.03852)/2+(.0535+.17192)/2);
AltWaterseweragePUTrate = (.05029+.03852)/2+(.0535+.17192)/2);
    WaterseweragePUT = WaterseweragePUTrate*waterseweragebase;
    AltWaterseweragePUT = AltWaterseweragePUTrate*waterseweragebase;
GarbagePUTrate = .036+.06372;
AltGarbagePUTrate = .036+.06372;
    GarbagePUT = GarbagePUTrate*garbagebase;
    AltGarbagePUT = AltGarbagePUTrate*garbagebase;
IntercityPUTrate = .01926;
AltIntercityPUTrate = .01926;
    IntercityPUT = IntercityPUTrate*intercitybase;
    AltIntercityPUT = AltIntercityPUTrate*intercitybase;
IntracityPUTrate = .01926;
AltIntracityPUTrate = .01926;
    IntracityPUT = IntracityPUTrate*intracitybase;
    AltIntracityPUT = AltIntracityPUTrate*intracitybase;

*Gas Tax;
Gasrate = .23;
Altgastax = .23;
    Gastax = gasrate*gasbase;
    Altgastax = altgastax*gasbase;

Alcoholtaxes = liquorsalestax_container + liquorvoltax_container +
                liquorsalestax_drink + liquorvoltax_drink +
Winelitertax + Beertax;
AltAlcoholtaxes = Altliquorsalestax_container + Altliquorvoltax_container +
                Altliquorsalestax_drink + Altliquorvoltax_drink +
AltWinelitertax + AltBeertax;
Tobaccotaxes = cigtax + othertobtax;
AltTobaccotaxes = Altcigtax + altothertobtax;
UtilityTaxes = ElecPUT + NatgasPUT + WaterseweragePUT + GarbagePUT +
                IntercityPUT + IntracityPUT;
AltUtilityTaxes = AltElecPUT + AltNatgasPUT + AltWaterseweragePUT +
                AltGarbagePUT + AltIntercityPUT + AltIntracityPUT;

TotalExciseTaxes = salestax + Alcoholtaxes + Instax + Tobaccotaxes +
UtilityTaxes + Gastax;
AltTotalExciseTaxes = alt1tax + Altalcoholtaxes + AltInstax +
AltTobaccotaxes +
AltUtilityTaxes + Altgastax;
run;

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*-----;
*Merge tax amounts with household characteristics from WAPOP;
*-----;

data excisetaxmerged&x;
merge excisetaxes&x z ;
by id;
households=1;
income=hhinc;
drop _freq_ _type_;
run;
%end;
%mend loop1;
%loop1;

OPTIONS ls=123 ps=52 pageno=1;

*-----;
*Calculate total tax by tax type;
*-----;

%macro loop2;
%do z=1 %to 7;
proc summary data=excisetaxmerged&z;
weight fnlwgt;
var salestax alt1tax alt2tax liquorsalestax_container liquorvoltax_container
Altliquorsalestax_container Altliquorvoltax_container liquorsalestax_drink
liquorvoltax_drink Altliquorsalestax_drink Altliquorvoltax_drink
Winelitertax AltWinelitertax Beertax AltBeertax Instax AltInstax
cigtax Altcigtax othertobtax altothertobtax
ElecPUT AltElecPUT NatgasPUT AltNatgasPUT WaterseweragePUT
AltWaterseweragePUT
GarbagePUT AltGarbagePUT IntercityPUT AltIntercityPUT IntracityPUT
AltIntracityPUT
Gastax Altgastax households peopl;
output out=weightedtax&z sum=;
run;
%end;
%mend loop2;
%loop2;

*Average the data from the seven imputation groups;

Data one;
set weightedtax1 weightedtax2 weightedtax3 weightedtax4
weightedtax5 weightedtax6 weightedtax7;
proc summary data=one;
var salestax alt1tax alt2tax liquorsalestax_container liquorvoltax_container
Altliquorsalestax_container Altliquorvoltax_container liquorsalestax_drink
liquorvoltax_drink Altliquorsalestax_drink Altliquorvoltax_drink
Winelitertax AltWinelitertax Beertax AltBeertax Instax AltInstax
cigtax Altcigtax othertobtax altothertobtax
ElecPUT AltElecPUT NatgasPUT AltNatgasPUT WaterseweragePUT
AltWaterseweragePUT
GarbagePUT AltGarbagePUT IntercityPUT AltIntercityPUT IntracityPUT
AltIntracityPUT
Gastax Altgastax households peopl;
output out=Aveweightedtax mean=;
run;

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Title1 "Total tax amounts for all groups (Average)";
proc print data=Aveweightedtax;
var salestax alt1tax alt2tax liquorsalestax_container liquorvoltax_container
Altliquorsalestax_container Altliquorvoltax_container liquorsalestax_drink
liquorvoltax_drink Altliquorsalestax_drink Altliquorvoltax_drink
Winelitertax AltWinelitertax Beertax AltBeertax Instax AltInstax
cigtax Altcigtax othertobtax altothertobtax
ElecPUT AltElecPUT NatgasPUT AltNatgasPUT WaterseweragePUT
AltWaterseweragePUT
GarbagePUT AltGarbagePUT IntercityPUT AltIntercityPUT IntracityPUT
AltIntracityPUT
Gastax Altgastax;
format salestax alt1tax alt2tax liquorsalestax_container
liquorvoltax_container
Altliquorsalestax_container Altliquorvoltax_container liquorsalestax_drink
liquorvoltax_drink Altliquorsalestax_drink Altliquorvoltax_drink
Winelitertax AltWinelitertax Beertax AltBeertax Instax AltInstax
cigtax Altcigtax othertobtax altothertobtax
ElecPUT AltElecPUT NatgasPUT AltNatgasPUT WaterseweragePUT
AltWaterseweragePUT
GarbagePUT AltGarbagePUT IntercityPUT AltIntercityPUT IntracityPUT
AltIntracityPUT
Gastax Altgastax commas15.;

run;

-----;
*Calculate Tax by income group for each imputation group;
-----;

OPTIONS ls=130 ps=50 pageno=1;
%macro loop3;
%do z=1 %to 7;
proc summary nway data=excisetaxmerged&z;
class hhinc ;
format hhinc incfmtd. ;
weight fnlwgt;
var TotalExciseTaxes AltTotalExciseTaxes AlcoholTaxes AltAlcoholTaxes
Tobaccotaxes
AltTobaccotaxes UtilityTaxes AltUtilityTaxes
salestax alt1tax alt2tax liquorsalestax_container liquorvoltax_container
Altliquorsalestax_container Altliquorvoltax_container liquorsalestax_drink
liquorvoltax_drink Altliquorsalestax_drink Altliquorvoltax_drink
Winelitertax AltWinelitertax Beertax AltBeertax Instax AltInstax
cigtax Altcigtax othertobtax altothertobtax
ElecPUT AltElecPUT NatgasPUT AltNatgasPUT WaterseweragePUT
AltWaterseweragePUT
GarbagePUT AltGarbagePUT IntercityPUT AltIntercityPUT IntracityPUT
AltIntracityPUT
Gastax Altgastax households peopl;
output out=weightedtaxbyinc&z sum=;
run;
%end;
%mend loop3;
%loop3;

*Add tax from each group and take average;

Data two;
set weightedtaxbyinc1 weightedtaxbyinc2 weightedtaxbyinc3
weightedtaxbyinc4 weightedtaxbyinc5 weightedtaxbyinc6

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weightedtaxbyinc7;
run;
Proc summary data = two nway;
class hhinc;
format hhinc incfmtd.;
var TotalExciseTaxes AltTotalExciseTaxes Alcoholtaxes AltAlcoholtaxes
Tobaccotaxes
AltTobaccotaxes UtilityTaxes AltUtilityTaxes
salestax alt1tax alt2tax liquorsalestax_container liquorvoltax_container
Altliquorsalestax_container Altliquorvoltax_container liquorsalestax_drink
liquorvoltax_drink Altliquorsalestax_drink Altliquorvoltax_drink
Winelitertax AltWinelitertax Beertax AltBeertax Instax AltInstax
cigtax Altcigtax othertobtax altothertobtax
ElecPUT AltElecPUT NatgasPUT AltNatgasPUT WaterseweragePUT
AltWaterseweragePUT
GarbagePUT AltGarbagePUT IntercityPUT AltIntercityPUT IntracityPUT
AltIntracityPUT
Gastax Altgastax households peopl;
output out=Aveweightedtaxbyinc mean=;
run;

*Divide by number of households by income group
and calc avg tax per household;

data avgtax1;
set Aveweightedtaxbyinc;
AvgTotalExciseTaxes = TotalExciseTaxes/households;
AvgAltTotalExciseTaxes = AltTotalExciseTaxes/households;
Avgsalestax = salestax/households;
Avgalt1tax = alt1tax/households;
Avgalt2tax = alt2tax/households;
avgAlcoholtaxes = Alcoholtaxes/households;
avgAltAlcoholtaxes = AltAlcoholtaxes/households;
avgInstax = instax/households;
avgAltinstax = altinstax/households;
avgTobaccotaxes = Tobaccotaxes/households;
avgAltTobaccotaxes = AltTobaccotaxes/households;
avgUtilityTaxes = UtilityTaxes/households;
avgAltUtilityTaxes = AltUtilityTaxes/households;
avgGastax = gastax/households;
avgAltgastax = altgastax/households;
avgpeopl = peopl/households;
drop _freq_ _type_;
run;

title1 "Average Tax for all Groups (Average) " ;
Proc tabulate data = avgtax1;
class hhinc;
format hhinc incfmtd.;
var AvgTotalExciseTaxes AvgAltTotalExciseTaxes Avgsalestax Avgalt1tax
Avgalt2tax
avgAlcoholtaxes avgAltAlcoholtaxes avgInstax avgAltinstax
avgTobaccotaxes avgAltTobaccotaxes
avgUtilityTaxes avgAltUtilityTaxes avgGastax avgAltgastax
avgpeopl;
table hhinc,(AvgTotalExciseTaxes AvgAltTotalExciseTaxes Avgsalestax
Avgalt1tax Avgalt2tax
avgAlcoholtaxes avgAltAlcoholtaxes avgInstax avgAltinstax
avgTobaccotaxes avgAltTobaccotaxes
avgUtilityTaxes avgAltUtilityTaxes avgGastax avgAltgastax)*f=comma10.

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avgpeopl*f=comma10.2;
run;

*Merge in total income by income group
and calc avg tax as percent of income;

data avgtax2;
merge aveweightedtaxbyinc incomebyclass;
by hhinc;
AvgTotalExciseTaxes = TotalExciseTaxes/income;
AvgAltTotalExciseTaxes = AltTotalExciseTaxes/income;
Avgsalestax = salestax/income;
Avgalt1tax = alt1tax/income;
Avgalt2tax = alt2tax/income;
avgAlcoholtaxes = Alcoholtaxes/income;
avgAltAlcoholtaxes = AltAlcoholtaxes/income;
avgInstax = instax/income;
avgAltinstax = altinstax/income;
avgTobaccotaxes = Tobaccotaxes/income;
avgAltTobaccotaxes = AltTobaccotaxes/income;
avgUtilityTaxes = UtilityTaxes/income;
avgAltUtilityTaxes = AltUtilityTaxes/income;
avgGastax = gastax/income;
avgAltgastax = altgastax/income;
drop _freq_ _type_;
run;

title1 "Tax as Percent of Income for all Groups (Average)" ;
Proc tabulate data = avgtax2;
class hhinc;
format hhinc incfmtd. ;
var AvgTotalExciseTaxes AvgAltTotalExciseTaxes Avgsalestax Avgalt1tax
Avgalt2tax
avgAlcoholtaxes avgAltAlcoholtaxes avgInstax avgAltinstax
avgTobaccotaxes avgAltTobaccotaxes
avgUtilityTaxes avgAltUtilityTaxes avgGastax avgAltgastax;
table hhinc,(AvgTotalExciseTaxes AvgAltTotalExciseTaxes Avgsalestax
Avgalt1tax Avgalt2tax
avgAlcoholtaxes avgAltAlcoholtaxes avgInstax avgAltinstax
avgTobaccotaxes avgAltTobaccotaxes
avgUtilityTaxes avgAltUtilityTaxes avgGastax avgAltgastax)*f=percent10.2;
run;

```